Lecture (10)
Making Rational Decision-making

Introduction

The rational decision-making model describes a series of steps that decision makers should consider if their goal is to maximize the quality of their outcomes. In other words, if you want to make sure that you make the best choice, going through the formal steps of the rational decision-making model may make sense.

Let's imagine that your old car has broken down, and you have enough money saved for a substantial down payment on a new car. It will be the first major purchase of your life, and you want to make the right choice. **The first step**, therefore, has already been completed—we know that you want to buy a new car. Next, in **step 2**, you'll need to decide which factors are important to you. How many passengers do you want to accommodate? How important is fuel economy to you? Is safety a major concern? You only have a certain amount of money saved, and you don't want to take on too much debt, so price range is an important factor as well. If you know you want to have room for at least five adults, get at least 20 miles per gallon, drive a car with a strong safety rating, not spend more than $20,000 on the purchase, and like how it looks, you have identified the decision criteria. All the potential options for purchasing your car will be evaluated against these criteria. Before we can move too much further, you need to decide how important each factor is to your decision in **step 3**. If each is equally important, then there is no need to weigh them, but if you know that price and mpg are key factors, you might weigh them heavily and keep the other criteria with medium importance. **Step 4** requires you to generate all alternatives about your options. Then, in **step 5**, you need to use this information to evaluate each alternative against

the criteria you have established. You choose the best alternative (**step 6**), and then you would go out and buy your new car **(step 7)**.

Of course, the outcome of this decision will influence the next decision made. That is where **step 8** comes in. For example, if you purchase a car and have nothing but problems with it, you will be less likely to consider the same make and model when purchasing a car the next time.

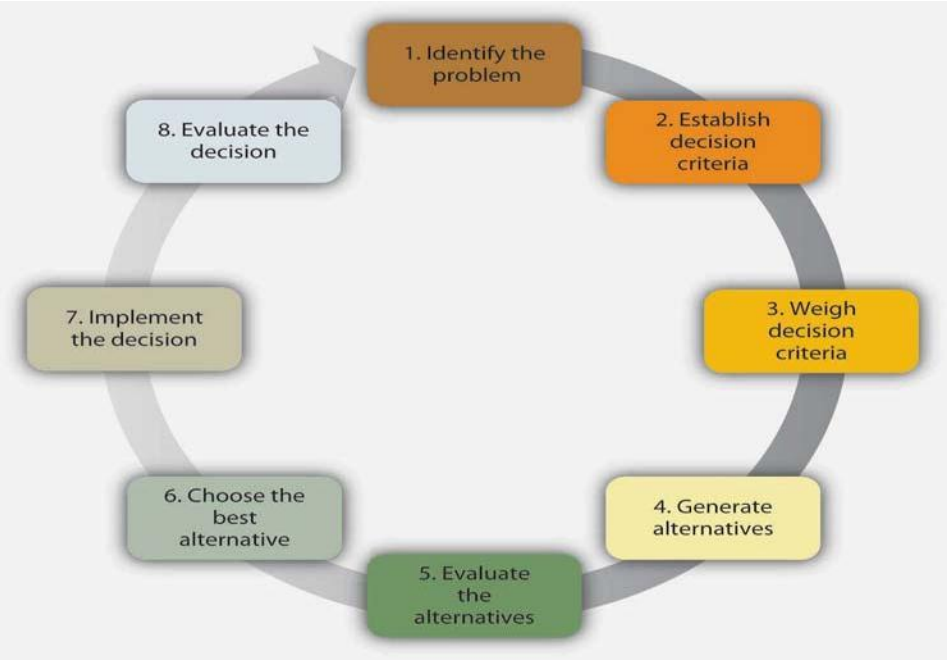

Figure 27: Steps in the Rational Decision-Making Model

While decision makers can get off track during any of these steps, research shows that searching for alternatives in the fourth step can be the most challenging and often leads to failure.

According to "Simon Herbert" we can differentiates among the types of rationality. A decision, in a given situation is:

- Objectively rational if it maximizes the value of the objective.
- Subjectively rational if it maximizes the attainment of value within limitation of the knowledge and awareness of the subject.

- Consciously rational to the extent the process of the decision-making is deliberate and a conscious one.
- Organizationally rational to the degree of the orientation towards the organization.
- Personally rational to the extent it achieves an individual's personal goals.

The Problems in Making Rational Decisions

(a) Ascertaining the problem: The most common source of mistakes in the management decisions is the emphasis on finding the right answers rather than the right questions. The main task is to define the right problem in clear terms. For example, the management may define the problem as the "Sales are declining". Actually, the decline of sales is symptomatic; The real problem may be somewhere else. The problem may be the poor quality of the product and you may be thinking of improving the quality of advertising.

(b) Insufficient knowledge: For perfect rationality, total information leading to complete knowledge is necessary. An important function of a manager is to determine whether the dividing line is reached between insufficient knowledge and the enough information to make a decision.

(c) Not enough time to be rational: The decision maker is under pressure to make decisions. If time is limited, he may make hasty decisions which may not satisfy the test of rationality of the decision.

(d) The environment may not cooperate: Sometimes, the timing of the decision is such that one is forced to make a decision but the environment is not conducive for it. The decision may fail the test of rationality as the environmental factors considered in the decision-making turn out to be untrue. For example, in a product pricing, the factor of oil and petroleum product price is considered as stable. But the post decision environment proves the consideration to be wrong.

(e) Other limitations: Other limitations are the need for a compromise among the different positions, misjudging the motives and values of people, poor communications, misappraisal of uncertainties and risks, and inability to handle the available knowledge and human behavior. How do we then ensure rationality? It is ensured, if the process of decision-making is carried out systematically, whereby all the aspects of the decision-making discussed above are taken care of. Herbert Simon said that a decision maker follows the process of decision-making disregarding the decision or the type of decision and the motive behind the decision. This process is followed consciously or without knowing it. We can put this process in the Decision-Making Model.

Decision Support Systems (DSS)

Introduction to DSS

DSS is an interactive, flexible computer based information system. It uses rules and models for processing data, to support various managerial levels, ranging from top executives to mangers, in their decision-making.

A DSS is usually built to support the solution of certain problem and does not replace the decision maker. As such, it is called a DSS application. It is user friendly with strong graphical capabilities.

Components of Decision Support System

The components of a DSS include a database of data used for query and analysis, software with models, data mining and other analytical tools and a user interface.

The DSS database is a collection of current or historical data from a number of applications or groups. It can be small database or a massive data warehouse from a large company, which is continuously being updated.

The DSS software system includes software tools for data analysis. They contain various OLAP tools (**online analytical processing enables users to interactively analyze multidimensional data from multiple perspectives**), data mining tools or a collection of mathematical and analytical models. A model can be a physical model, a mathematical model or a verbal model. Most commonly used are the statistical functions such as means, medians, deviations and scatter plots. Optimization models such as linear programming are used to determine optimal resource allocation.

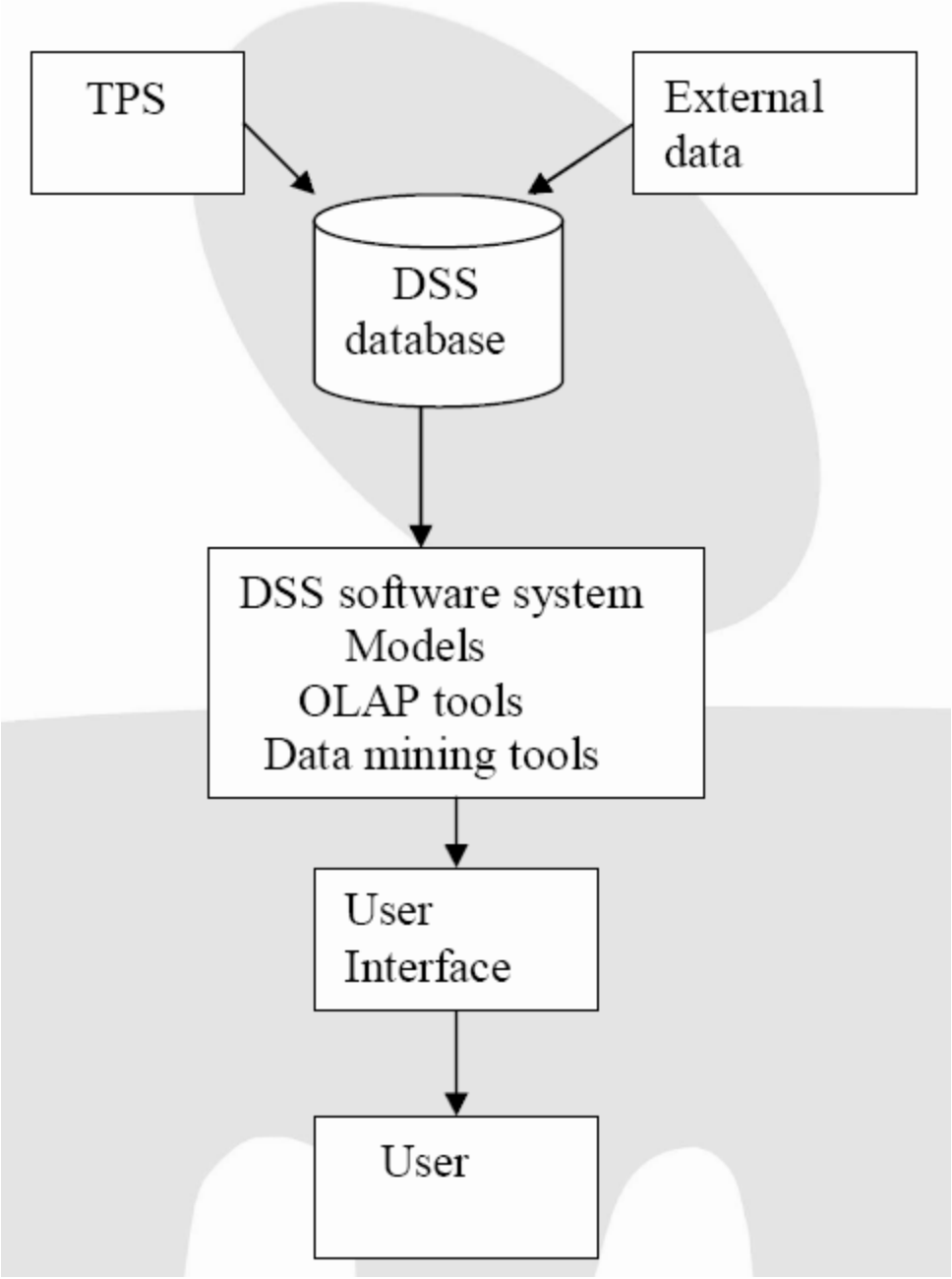

Figure: 28 Component of a Decision Support System

Types of Decision Support Systems

There are several ways to classify DSS applications. Not every DSS fits neatly into one category, but a mix of two or more architecture in one.

- Communication-driven DSS supports more than one person working on a shared task; examples include integrated tools like Microsoft's NetMeeting or Groove.
- Data-driven DSS or data-oriented DSS emphasizes access to and manipulation of a time series of internal organization data and, sometimes, external data.
- Document-driven DSS manages, retrieves, and manipulates unstructured information in a variety of electronic formats.
- Knowledge-driven DSS provides specialized problem-solving expertise stored as facts, rules, procedures, or in similar structures.
- Model-driven DSS emphasizes access to and manipulation of a statistical, optimization, or simulation model. Model-driven DSS use data and parameters provided by users to assist decision makers in analyzing a situation; they are not necessarily data-intensive.

Benefits of DSS

1. Improves personal efficiency.
2. Expedites problem solving (speed up the progress of problems solving in an organization).
3. Facilitates interpersonal communication.
4. Promotes learning or training.
5. Increases organizational control.

6. Creates a competitive advantage over competition.
7. Helps automate the managerial processes.

Model of DSS

The model of a DSS may be represented as a block diagram as indicated below:–

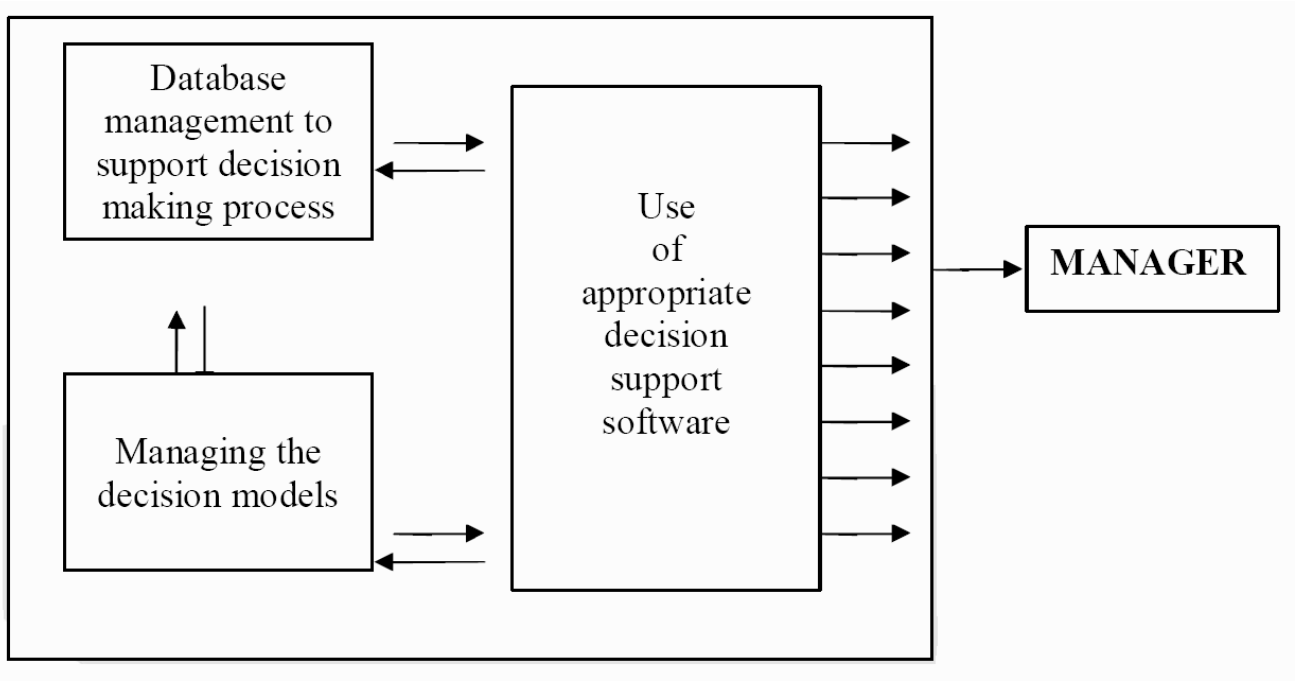

Figure: 29 Proposed model for decision support system